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Daniel H. Bliss
Bliss McGlynn P.C.
Suite 600
2075 West Big Beaver Road
Troy, MI 48084

EXAMINER	
PROCTOR, JASON SCOTT	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte J.G. WALACAVAGE and JIM D. COBURN

Appeal 2009-004434
Application 09/965,905
Technology Center 2100

Decided: October 20, 2009

Before JOSEPH L. DIXON, THU A. DANG, and
CAROLYN D. THOMAS, *Administrative Patent Judges*.

DIXON, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellants appeal under 35 U.S.C. § 134(a) (2002) from a final rejection of claims 1-8, 10 and 12-21. Claims 9 and 11 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b) (2008).

We REVERSE.

I. STATEMENT OF THE CASE

The Invention

The Appellants invented a method of part flow model for programmable logic controller (PLC) logical verification system (Spec. 1, ll. 15-17).

The Illustrative Claim

Claim 1, an illustrative claim, reads as follows:

> 1. A method of part flow for a programmable logic controller logical verification system, said method comprising the steps of:
>
> constructing a simulation model of a manufacturing line using a computer;
>
> playing the simulation model by a PLC logical verification system on the computer and viewing a flow of a part through the manufacturing line by a user, wherein the PLC logical verification system dynamically interacts through input and output with the simulation model to verify a PLC code of the manufacturing line;
>
> determining if the part flow represented in the simulation model is correct to the user;
>
> generating the PLC code if the part flow represented in the simulation model is correct; and
>
> using the generated PLC code and implementing the manufacturing line according to the part flow simulation model.

The Rejections

The following rejections are before us for review:

Claims 1, 10, 12 and 20-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Erickson.

Claims 2-8 and 13-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Erickson in view of LeBaron.

The References

The Examiner relied upon the following prior art as evidence in support of rejections:

Cynthia Erickson et al., *Simulation, Animation, and Shop-Floor Control*, Proc. of the 1987 Winter Simulation Conf., A. Thesen, H. Grant, W. David Kelton, eds. (hereinafter Erickson).

Todd LeBaron & Kelly Thompson, *Emulation of A Material Delivery System*, Proc. of the 1998 Winter Simulation Conf., D.J. Medeiros, E.F. Watson, J.S. Carson and M.S. Manivannan, eds. (hereinafter LeBaron).

II. ISSUES

Have the Appellants shown that the Examiner erred in finding that Erickson discloses:

> playing the simulation model by a PLC logical verification system on the computer and viewing a flow of a part through the manufacturing line by a user, wherein the PLC logical verification system dynamically interacts through input and output with the simulation model to verify a PLC code of the manufacturing line,

as recited in the independent claims 1 and 12?

Have the Appellants shown that the Examiner erred in finding that Erickson discloses "constructing a simulation model of a part flow in a manufacturing line using a computer by selecting a part generator,

generating a part with the part generator, and identifying part locations of the part in the manufacturing line" and "viewing a flow of the part through the manufacturing ling by a change of color at any of the part location by a user", as recited in independent claim 21?

III. PRINCIPLES OF LAW

Prima Facie Case of Unpatentability

The allocation of burden requires that the United States Patent and Trademark Office (USPTO) produce the factual basis for its rejection of an application under 35 U.S.C. §§ 102 and 103. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d 1011, 1016 (CCPA 1967)). Appellant has the opportunity on appeal to the Board of Patent Appeals and Interferences (BPAI) to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) (citing *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998).

Anticipation

"[A]nticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim . . . ." *In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986) (citing *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1457 (Fed. Cir. 1984)). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1571 (Fed. Cir. 1986) (citing *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1573 (Fed. Cir. 1984)). Inherency is not established by probabilities or possibilities. *MEHL/Biophile Int'l Corp. v. Milgraum*, 192 F. 3d 1362, 1365 (Fed. Cir. 1999) (citing *In re Oelrich*, 666 F.2d 578, 581

(CCPA 1981)). That a certain thing may result from a given set of circumstance is not sufficient to establish inherency. *Id.*

Obviousness

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

IV. FINDINGS OF FACT

The following findings of fact (FFs) are supported by a preponderance of the evidence.

1. Erickson discloses an embodiment for developing and utilizing a simulation model linked directly to a PLC to verify the control logic of the PLC. (Erickson at 649). The implementation of the verification system may be: 1) the simulation program reads the register value that represents an event generation of the PLC from the register of the PLC to test the control logic of the PLC; and 2) the interface cards of PLCs poll or receive the information of the system as a database for the simulation and transmit the information through RS 232C port to the simulation program for the control logic verification of PLC. (*Id.* at 649-650). "Animation now supplies the analyst with a means to graphically depict the simulation of the system's operations and their interaction." (*Id.* at 649).

2. Erickson also discloses an embodiment of emulation that describes graphical system displaying the current status of manufacturing shop floor.

> *A second application of linking simulation and animation to shop-floor is emulation. Rather than testing logic of individual PLC's, emulation graphically depicts the current status of the manufacturing system.* This status is updated in real time as simulation language uses the shop-floor interfaces to detect changes in the system as processes are completed or new jobs arrive. The primary use of emulation is for remote monitoring of the system's function, in which a graphical display on an office desk might provide information about system faults, switches sticking, buffers overflowing, etc.

(Erickson at 650) (emphasis added).

3. Erickson further discloses that the simulation model polls the registers of the PLC's to detect changes in status. The "[c]ommunication is strictly one way -- the simulation model gathers information and updates the simulation (and animation) without providing any input to the PLC." (Erickson at 652).

V. ANALYSIS

The Examiner set forth a detailed explanation of a prima facie case of obviousness in the Examiner's Answer. Therefore, we look to the Appellants' Briefs to show error in the proffered prima facie case.

35 U.S.C. § 102(b)

With respect to claims 1 and 12, the Appellants contend that Erickson does not teach or suggest "playing the simulation model by a PLC logical verification system on a computer and viewing a flow of a part through a manufacturing line by a user" because Erickson "merely discloses linking shop-floor hardware such as programmable controllers directly to a discrete-

event simulation model or a graphical animation using a system emulator." (App. Br. 14).

The Examiner maintains that the claimed language is anticipated by Erickson.

> A second application of linking simulation and animation to shop-floor control is emulation. Rather than testing logic of individual PLC's, emulation graphically depicts the current status of the manufacturing system. This status is updated in real time as the simulation language uses the shop-floor interfaces to detect changes in the system as processes are completed or new jobs arrive.

(Erickson at 650).

> Erickson expressly discloses a PLC logical verification system by stating *"Linking a simulation directly to a programmable logic controller (PLC) provides a means to test the control logic of the PLC. [...] Once the control logic for the PLC has been written, it must be debugged and tested. Currently, much of this verification takes place on the shop floor once the manufacturing system is in place. [...] To verify the PLC logic using simulation, a model of the physical system must be developed; however, the timing of some events would be generated by the PLC."*

(Ans. 8) (citation omitted).

We disagree with the Examiner's reading of the Erickson reference. While teaching a simulation application for verifying the control logic of PLC's, Erickson does not teach "viewing a flow of a part through a manufacturing line by a user" in the section 2 Testing Control Logic (FF 1). Both implementations of the verification system in section 2 of Erickson only expressly mention detecting a stored value as a possible event generation for further simulation. The Examiner cited portions of section 3

of Manufacturing System Emulation for the argued limitations. However, the cited emulation system is another embodiment of Erickson that teaches linking simulation and animation for remotely monitoring the function of the manufacturing system, which is not related to the control logic verification of PLC's (FF 2). The Examiner does not provide a description of a single embodiment meeting all of the limitations of the claimed control logic verification system encompassed by claims 1 and 12, which is required to support a finding of prima facie anticipation under §102(b). *See In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). In our view, the argued claim limitations are not identical to either embodiment of Erickson. Thus, Erickson does not anticipate claims 1 and 12.

The Appellants further contend that Erickson fails to teach "the PLC logical verification system dynamically interacting through input and output with a simulation model to verify a PLC code of the manufacturing line." (App. Br. 14) (emphasis omitted). The Appellants also argue that Erickson discloses "the emulator does not allow dynamic interaction directly with a simulation model to test PLC logic to verify a PLC code of the manufacturing line." (Reply Br. 3.)

The Examiner maintains that Erickson expressly teaches

> *"To verify the PLC logic using simulation, a model of the physical system must be developed; however, the timing of some events would be generated by the PLC."* (emphasis added; pages 649-650, "2. Testing Control Logic") and by stating *"A second application of linking simulation and animation to shop-floor control is emulation.* [... The status of the manufacturing system] is *updated in real time as the simulation language uses the shop-floor interfaces to detect changes in the system as processes are completed or new jobs arrive."*

(Ans. 8) (citation omitted).

We disagree. Here, the Examiner again used two distinct embodiments to reject the argued limitation under §102(b). In addition, we find that Erickson expressly states that the communication between PLC and the simulation model is strictly one way (FF 3), and, thus, Erickson does not teach "dynamically interacting through input and output with the simulation model".

Accordingly, we cannot sustain the anticipation rejection of independent claims 1 and 12.

The Appellants also contend that Erickson fails to teach "constructing a simulation model of a part flow in a manufacturing line using a computer by selecting a part generator, generating a part with the part generator, and identifying part locations of the part in the manufacturing line." (App. Br. 20, Reply Br. 4-5).

We agree with the Appellants' contention. We find that Erickson mentions developing a simulation model. (FF 1). We, however, find that Erickson does not disclose how to construct a simulation model, nor does Erickson disclose developing a simulation model "by selecting a part generator, generating a part with the part generator, and identifying part locations of the part in the manufacturing line."

The Examiner's arguments that Erickson implicitly discloses system emulation are unpersuasive. First, the simulation model used in the system emulation may not be developed as the claimed invention. Thus, by merely mentioning "developing a simulation model," Erickson does not teach the specifics of the claimed limitations, such as selecting a part generator. Furthermore, as discussed above, the system emulation is a different

embodiment of Erickson from the embodiment of control logic verification of PLC. It is inappropriate to combine two distinct embodiments in a rejection based upon §102(b). Finally, Erickson expressly teaches that "[r]ather than testing logic of individual PLC's, emulation graphically depicts the current status of the manufacturing system." (FF 2).

With respect to claim 21, the Appellants contend that Erickson fails to teach "viewing a flow of the part through the manufacturing ling by a change of color at any of the part location by a user." (App. Br. 20, Reply Br. 5). The Examiner maintains that "it would be impossible to disclose animation on a computer display without also inherently disclosing a change of colors, because it is only through assigning colors can a computer display be useful." (Ans. 12) (emphasis omitted).

We disagree with the Examiner's argument. To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (quoting *In re Oelrich*, 666 F.2d at 581). Here, besides changing the colors of the locations of part, there are many ways to represent a location of a part when a user views a flow of the part in an animated display such as using sounds or using highlights. Thus, the inherency reasoning of the Examiner for the argued limitation must fail. The Examiner has not shown, and we do not readily find, where Erickson discloses the argued limitations.

Accordingly, we cannot sustain the anticipation rejection of claim 21.

The rejection of dependent claims 10 and 20 contains the same deficiencies.

Because we agree with at least one of the Appellants' contentions, we reverse the anticipation rejection of claims 1, 10, 12, and 20-21.

35 U.S.C. § 103(a) Rejection

We next consider the rejection of claims 2-8 and 13-19 under 35 U.S.C. § 103(a) as being unpatentable over Erickson in view of LeBaron.

The rejection of dependent claims 2-8 and 13-19 contains the same deficiencies as the rejections of claims 1, 10, 12, 20 and 21 under 35 U.S.C. § 102(b) discussed above. The Examiner has not identified how LeBaron remedies the noted deficiencies (the Examiner cites LeBaron for different limitations (Ans. 14-15)). Therefore, we cannot sustain the obviousness rejection of dependent claims 2-8 and 13-19.

VI. CONCLUSION

We conclude that the Appellants have shown that the Examiner erred in finding that Erickson discloses "playing the simulation model by a PLC logical verification system on the computer and viewing a flow of a part through the manufacturing line by a user, wherein the PLC logical verification system dynamically interacts through input and output with the simulation model to verify a PLC code of the manufacturing line", as recited in independent claims 1 and 12.

We also conclude that the Appellants have shown that the Examiner erred in finding that Erickson discloses "constructing a simulation model of a part flow in a manufacturing line using a computer by selecting a part

generator, generating a part with the part generator, and identifying part locations of the part in the manufacturing line" and "viewing a flow of the part through the manufacturing line by a change of color at any of the part locations by a user," as recited in independent claim 21.

VII. DECISION

We reverse the Examiner's rejections of claims 1-8, 10, and 12-21.

REVERSED

nhl

DANIEL H. BLISS
BLISS MCGLYNN P.C.
SUITE 600
2075 WEST BIG BEAVER ROAD
TROY, MI 48084